

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 November 2002 (28.11.2002)

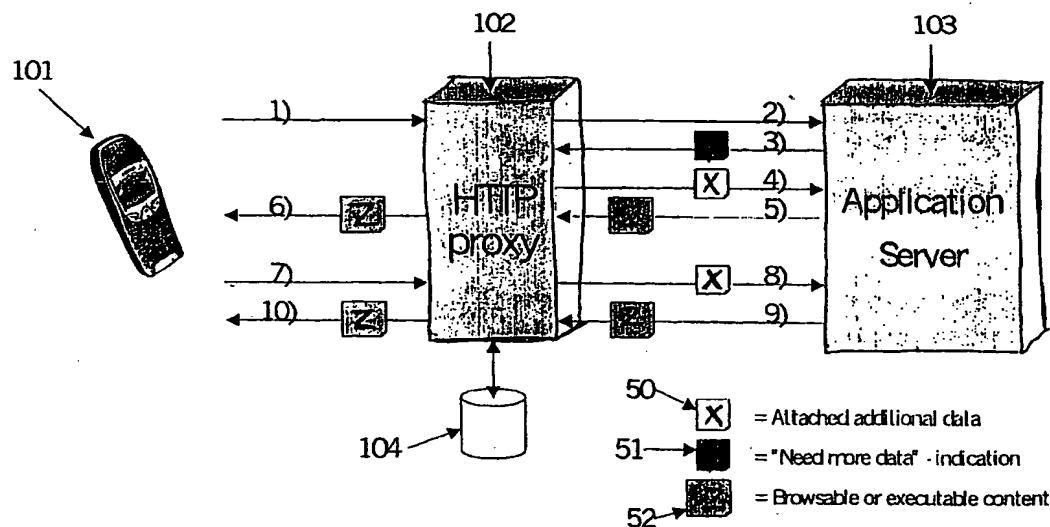
PCT

(10) International Publication Number
WO 02/096063 A2

- (51) International Patent Classification⁷: **H04L 29/06** (74) Agents: **STYLE, Kelda, Camilla, Karen et al.**; Page White & Farrer, 54 Doughty Street, London WC1N 2LS (GB).
- (21) International Application Number: **PCT/IB02/02863**
- (22) International Filing Date: **24 May 2002 (24.05.2002)** (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data: **0112780.2** **25 May 2001 (25.05.2001)** **GB**
- (71) Applicant (*for all designated States except US*): **NOKIA CORPORATION [FI/FI]**; Keilalahdentie 4, FIN-02150 ESPOO (FI).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **OVASKAINEN, Mika [FI/FI]**; Strömbergintie 8 F 168, FIN-02150 Espoo (FI). **MATTILA, Arto [FI/FI]**; Vesilahdentie 94, FIN-37500 Lempäälä (FI). **ZILLIKENS, Frank [DE/DE]**; Buschstrasse 16, 45276 Essen (DE).
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— *without international search report and to be republished upon receipt of that report*

[Continued on next page]

(54) Title: REQUESTS IN A COMMUNICATION SYSTEM



(57) Abstract: A method for provision of service in a communication system and a communication system is disclosed. When a request for a service is received it is verified if additional information needs to be attached to the request. The verification is based on information stored in the storage means. If it is detected that a service provider requires additional information in association with a request for a service, information associated with said detected requirement is stored in storage means to update said storage means.

WO 02/096063 A2

WO 02/096063 A2



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Requests in a communication system

Field of the Invention

- 5 The present invention relates to communication between a client and a service provider entity, and in particular, but not exclusively, to a system wherein a request by the client may need to be supported by additional data.

10 Background of the Invention

- In a communication system a service provider entity may provide a client with various services. For example, a client such as a user terminal may be provided upon request with
15 information associated with a specific subject or with other data. The other data can be, without limiting to these, video or other image data, voice data, an executable program or means required for executing a program and so on. In this specification all data provided by the service provider
20 entity to clients will be referred to by the term "content". The client may be any entity that may make use of the content or other services provided by the service provider entity.

- A client may request for a service from a service provider
25 entity such as from an application server. A request by the client may be first routed to an intermediate server entity. The intermediate server entity is located on the message path between the client entity and the application server. The intermediate server entity can be seen as acting as a client
30 to the application server entity. The original client in turn is the client for the intermediate server entity.

The service application entity may be identified by the means of a uniform resource locator (URL) or similar address indicator. The intermediate server entity receives the request and forwards the request to the service application
5 entity.

The service application entity may need additional data associated with the client in order to be able to provide the requested content. However, the service application entity
10 may notice after reception of the request that the request does not contain all data that is required for provisioning of the requested content. The service application entity may thus need to request more information from the intermediate server entity. In the prior art this is accomplished by means
15 of a message that indicates that additional data is needed. Said message may also contain information what kind of additional data the service application entity needs.

The intermediate server entity receives the message and in
20 response thereto collects the requested additional data and sends either the additional data or a new request incorporating the requested additional data. The new request may be a repeat of the original request such that it includes also said additional data.

25

The service application entity may thus need to receive the new request before being capable of generating and returning any content in response to the request. The additional signalling between the service application provisioning
30 entity and the intermediate node consumes communication resources. This kind of operation is also time consuming. The queries also cause additional workload for the service

provider entity. This may reduce the number of request that can be served in a given time, e.g. per second.

Summary of the Invention

5

Embodiments of the present invention aim to address one or several of the above problems.

According to one aspect of the present invention, there is
10 provided a method in a communication system, the method comprising: detecting that a service provider requires additional information in association with a request; storing in storage means information associated with said detected requirement; receiving a request; and verifying if additional
15 information needs to be attached to the request based on information stored in the storage means.

According to another aspect of the present invention there is provided a communication system comprising a service provider
20 adapted for provision of content in response to a request for a service and storage means for storing information associated with the service provider, said storage means being adapted to be updated to contain information associated with a requirement of additional information to be attached
25 to said request in response to an event indicative of such requirement.

According to another aspect of the present invention there is provided a server of a communication system, comprising:
30 means for determining if additional information in association with requests for services is required by service providers; storage means for storing information associated with said requirements; means for processing requests for

services; and means for verifying if additional information needs to be attached to the requests for services based on information stored in the storage means.

- 5 In a form of the invention said storing of information is triggered by a request by the service provider for additional information. The service provider may send said request for additional information in response to receiving a request for service that is insufficient from the information content
10 thereof. A failed request may also trigger said step for storing information. An operator may also trigger said step for storing information.

- The received request may originate from a client. The request
15 from the client may be received at an intermediate node comprising said storage means. Said intermediate node may be adapted to accomplish said verification and subsequent thereto to transfers the request with or without the additional information to the service provider. Said
20 verification may also be accomplished by client.

Said additional information may be collected based on information stored in the storage means.

- 25 Said request may include address information associated with the service provider. Said address information may comprise a universal resource locator (ULR) of the service provider.

- The step of storing information associated with said detected
30 requirement may comprise storing information about the address of the service provider. The step of verifying may comprise checking if information associated with the address of the service provider can be found from the storage means.

Information associated with detected requirements may be stored adaptively in the storage means during the operation of the communication system.

5 The embodiments of the invention may provide advantage in that there is no longer a need for an additional message transfer between a server entity and a service application entity. The service provisioning may be made quicker than before. A service provider may be provided with improved
10 possibilities to handle more request in a given time.

Brief Description of Drawings

For better understanding of the present invention, reference
15 will now be made by way of example to the accompanying drawings in which:

Figure 1 shows one embodiment of the present invention;
and

Figure 2 is a flowchart illustrating the operation of an
20 embodiment of the present invention.

Description of Preferred Embodiments of the Invention

Reference is first made to Figure 1 which shows a system
25 comprising a client entity 101, an intermediate node 102, and a service application server entity 103. It shall be appreciated that a typical communication network comprises a number of entities such as various stations, routers, switches, controllers, registers and so on. However, these
30 known entities are not an essential part of the present invention and are thus not shown or described herein.

The client entity 101 may be any entity that is adapted to request for a service from the service application server entity 103 and to make use of content provided by the service application entity 103 in response to said request. The
5 content may be used, for example, for execution of a program employed in provision of a service requested by the client entity 101.

In Figure 1 the client entity 101 is shown to comprise a
10 mobile station (MS). The mobile station may comprise a mobile telephone or other portable device that may be used for voice and/or data communication by the user thereof. The mobile station 101 may communicate via a wireless interface with a transceiver entity of a cellular communication network in a
15 manner known by the skilled person.

In a more specific embodiment the client entity comprises e.g. a browser function of the mobile station or a computer. The client may also be a program that makes use of content
20 provided by the service application entity 103.

The intermediate node 102 is located on the message path between the client 101 and the service application server entity 103. The intermediate node 102 is adapted to act as a
25 client to the service provider entity 103. The mobile station 101, in turn, is the client for the intermediate node 102.

The intermediate node 102 may, for example, comprise a proxy server. The intermediate proxy server may be arranged to
30 operate in accordance with an appropriate transfer protocol such as the hypertext transfer protocol (HTTP) or similar. The intermediate node may also comprise a wireless application protocol (WAP) gateway. Any other entity

providing the appropriate gateway function between the client entity 101 and the service provider entity 103 may also be used.

- 5 The service application server 103 may be adapted run on a HTTP server or similar. The service application entity 103 may also be provided by means of a dedicated program. The service application entity 103 may need additional data associated with the client in order to response a service
10 request with appropriate content.

However, as discussed above the initial service request generated by the client may not include all required data. Such additional data may comprise information regarding the
15 location of the client entity, authorisation procedures (e.g. passwords, identity codes and so on), subscriber data or any other data that the service provisioning entity 103 may require for service provisioning.

- 20 To address the provisioning of the additional data a persistent storage means 104 is provided in association with the intermediate node 102. The storage means is adapted to store indications of services that require additional data to be associated with a service request. The storage means 104
25 may, for example, store the addresses of such service providers that require the additional information. The address information may comprise any address information such as universal resource locators (URL).

- 30 The persistent storage means 104 may be e.g. used to hold a list or similar record e.g. of those universal resource locators requiring additional data and also the additional data that is required. If a URL associated with a request can

be found from the list this means that the service pointed by that URL needs additional data to be attached to the request.

The following will describe a possible operation with
5 reference also to the flowchart of Figure 2.

The client entity 101 may initiate service provisioning by sending a request 1) for content to the service provisioning server 103. The source of the service is indicated by the
10 means of a uniform resource locator (URL) of the service provisioning server 103.

The intermediate server 102 receives the request 1). The intermediate server 102 then verifies if the URL can be found
15 from the persistent storage means 104. If the URL is found then the intermediate server 102 fetches and/or generates the additional data that the service application 103 needs.

A description of the additional data may also be stored in
20 the storage means 104. The intermediate node then collects the data from appropriate sources and attaches the data in the request. For example, if the additional data comprises location information the intermediate node may request location information e.g. from a location service node, from
25 the mobile station client itself and so on.

After having attached all required data to the request the intermediate server 102 sends the request to the service application 103 with the additional data.

30

If the intermediate server 102 does not find the URL from the list in the persistent storage means 104, the request can be

transported to the application service 103 without attaching any additional data thereto.

5 In Figure 1 the URL of the request 1) was not found to be included the list in the storage means 104. Therefore the intermediate server entity 102 did not attach any additional data to the request 2) that was forwarded from the intermediate server 102 to the service application entity 103.

10 When the service application entity 103 receives the request 2) it, however, notices that the request does not contain all data that is required. The service application 103 may thus respond to the intermediate server 102 with a message 3) that 15 indicates that additional data is needed, as indicated by box 51). The message may contain information regarding the additional data that is needed by the service application entity 103.

20 The intermediate server 102 receives the response and notices that additional data is needed by the service application 103. The intermediate server 102 saves the URL of said request to the persistent storage means 104. The intermediate server also collects the requested additional data and sends 25 request 4) incorporating the requested additional data 50). The message 4) may be a repeat of the request 1) together with said additional data.

30 When the service application entity 103 receives the new request 4) it can generate content based on the additional data. The service application 103 then responds with the content 5). The intermediate server 102 receives the content and delivers it further to the client entity 101 by a message

6) as a response to the original request 1) by the client entity 101.

When the client entity 101 sends a new request 7) associated with the same URL again the intermediate server 102 can now find said URL from the persistent storage means 104 because the URL was stored in response to the step 3) above. Based on this the intermediate server 102 knows that this URL needs additional data to be attached to the request.

10

Step 3) also provided the intermediate node with description of the data that needs to be provided for the service provision entity 103. The intermediate node 102 may thus then collect and/or generate the additional data 5) and attach the additional data to the request 8) to be sent to the service application 103.

The service application entity 103 then generates the content based on the additional data and returns the content in a response 9). The intermediate node 102 then delivers the response 10) to the client 101.

To summarise the learning procedure, a service application entity may require additional information from an intermediate node to be attached to a request for a service. Upon realising this, the intermediate node may store the URL or other identity information that associated with the service application entity in a storage means. During further interactions with clients, the intermediate node may then immediately check from the storage means whether the request needs to be augmented with additional information prior to its transmission to the service application entity.

- In addition to operations cycles as described with reference to message 2) to 5) of Figure 1, the intermediate node may be adapted to learn from instances wherein additional information is required in response to other events. For example, a failed service request may be used to indicate that additional data is required. The operator may also teach the intermediate node to recognise such request that require additional information.
- 10 The additional information can thus be attached without a need for a roundtrip between the intermediate node and the service application. This eliminates the additional transfer needed between intermediate and service application.
- 15 According to a further embodiment the client entity 101 is provided with appropriate storage and verification functions. That is, the client entity 101 may be adapted to store information regarding the requirements of various service providers. Before sending a request for a service the client entity may check if any additional requirements are known to it. If so, the client entity 101 itself may arrange the provision of the additional data to the service provisioning entity.
- 20
- 25 The client entity may, for example, gather the required information by itself or ask another node, such as the intermediate node, to collect and attach the required information to the request.
- 30 According to an embodiment a default set of attributes or similar additional information parameters is stored in the database 104. As a default, these attributes are then sent together with service requests to all URLs. However, if a URL

associated with a request is found from the database, this indicates that the request is an the exceptions to the default rule.

- 5 It is also possible to store information associated with groups of service providers so that a service provider of the group will be provided or alternatively will not be provided with the additional information.
- 10 It should be appreciated that whilst embodiments of the present invention have been described in relation to mobile stations, embodiments of the present invention are applicable to any other suitable type of user equipment.
- 15 It is also noted herein that while the above describes exemplifying embodiments of the invention, there are several variations and modifications which may be made to the disclosed solution without departing from the scope of the present invention as defined in the appended claims.

Claims

1. A method in a communication system, the method comprising:
 - 5 detecting that a service provider requires additional information in association with a request;
storing in storage means information associated with said detected requirement;
 - receiving a request; and
 - 10 verifying if additional information needs to be attached to the request based on information stored in the storage means.
2. A method as claimed in claim 1, wherein a request by the
15 service provider for additional information triggers said step for storing information.
3. A method as claimed in claim 2, wherein the service provider sends said request for additional information in
20 response to receiving a request that is insufficient from the information content thereof.
4. A method as claimed in any preceding claim, wherein a failed request triggers said step for storing information.
25
5. A method as claimed in any preceding claim, wherein an operator triggers said step for storing information.
6. A method as claimed in any preceding claim, wherein the
30 received request originates from a client.
7. A method as claimed in claim 6, wherein the request from the client is received at an intermediate node comprising

said storage means, said intermediate node accomplishes said verification, and subsequent to the verification transfers the request with or without the additional information to the service provider.

5

8. A method as claimed in claim 6, wherein the client accomplishes said verification prior transmission of the request.

10 9. A method as claimed in any preceding claim, wherein said additional information is collected based on information stored in the storage means.

15 10. A method as claimed in claims 8 and 9, wherein the client collects said additional data.

11. A method as claimed in claims 7 and 9, wherein the intermediate node collects said additional data.

20 12. A method as claimed in any preceding claim, wherein said request includes address information associated with the service provider.

25 13. A method as claimed in claim 12, wherein said address information comprises a universal resource locator (URL) of the service provider.

30 14. A method as claimed in any preceding claim, wherein the step of storing information associated with said detected requirement comprises storing information about the address of the service provider.

15. A method as claimed in any of claims 12 to 14, wherein the step of verifying comprising checking if information associated with the address of the service provider can be found from the storage means.

5

16. A method as claimed in claim 6 or any claim when appended to claim 6, wherein the client entity comprises a mobile station.

10

17. A method as claimed in any preceding claim, said additional information being selected from the following list: location data; authorisation data; subscriber data.

15

18. A method as claimed in any preceding claim, wherein information associated with detected requirements is stored adaptively in the storage means during the operation of the communication system.

20

19. A communication system comprising a service provider adapted for provision of content in response to a request for a service and storage means for storing information associated with the service provider, said storage means being adapted to be updated to contain information associated with a requirement of additional information to be attached to said request in response to an event indicative of such requirement.

25

20. A communication system as claimed in claim 19, wherein the event comprises at least one of: a request by the service provider for additional information; a failed request for service; instructions by the operator of the communication system.

30

21. A communication system as claimed in claim 19 or 20, comprising a client generating the request for the service.
22. A communication system as claimed in claim 21, wherein
5 the request from the client is received by an intermediate node comprising said storage means, said intermediate node being arranged to update the storage means and to attach the additional information to request send to the service provider.
- 10 23. A communication system as claimed in claim 22, wherein the intermediate node is adapted to collect said additional information based on information stored in the storage means.
- 15 24. A communication system as claimed in claim 22 or 23, wherein the intermediate node comprises a proxy server.
25. A communication system as claimed in any of claims 22 to 24, wherein intermediate node is adapted to operate in
20 accordance with the hypertext transfer protocol (http).
26. A communication system as claimed in claim 22 or 23, wherein the intermediate node comprises a gateway.
- 25 27. A communication system as claimed in claim 26, wherein the gateway is adapted to operate in accordance with the wireless application protocol (WAP).
- 30 28. A server of a communication system, comprising:
means for determining if additional information in association with requests for services is required by service providers;

storage means for storing information associated with
said requirements;

means for processing requests for services; and

means for verifying if additional information needs to
5 be attached to the requests for services based on information
stored in the storage means.

1/2

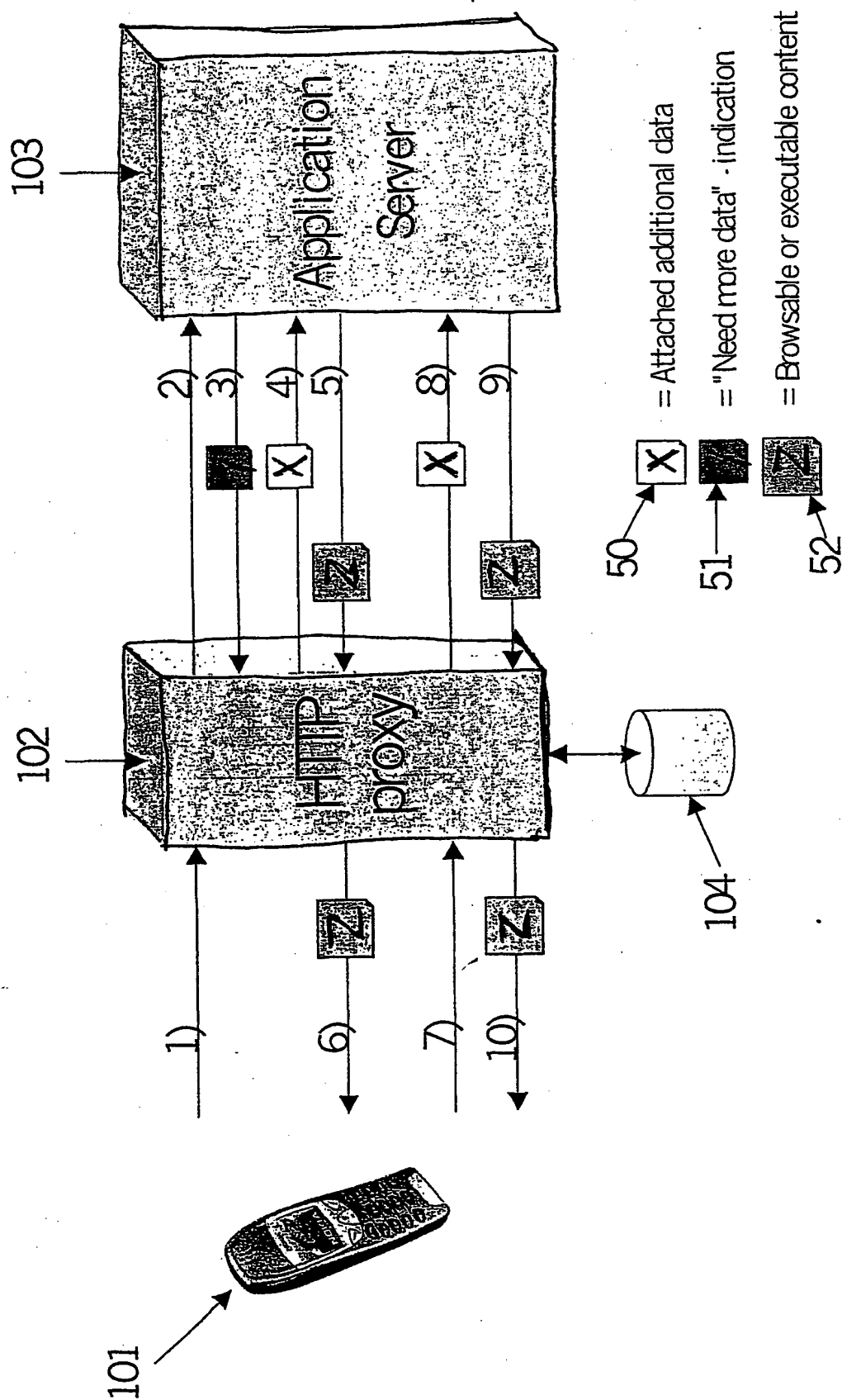


Fig. 1

2/2

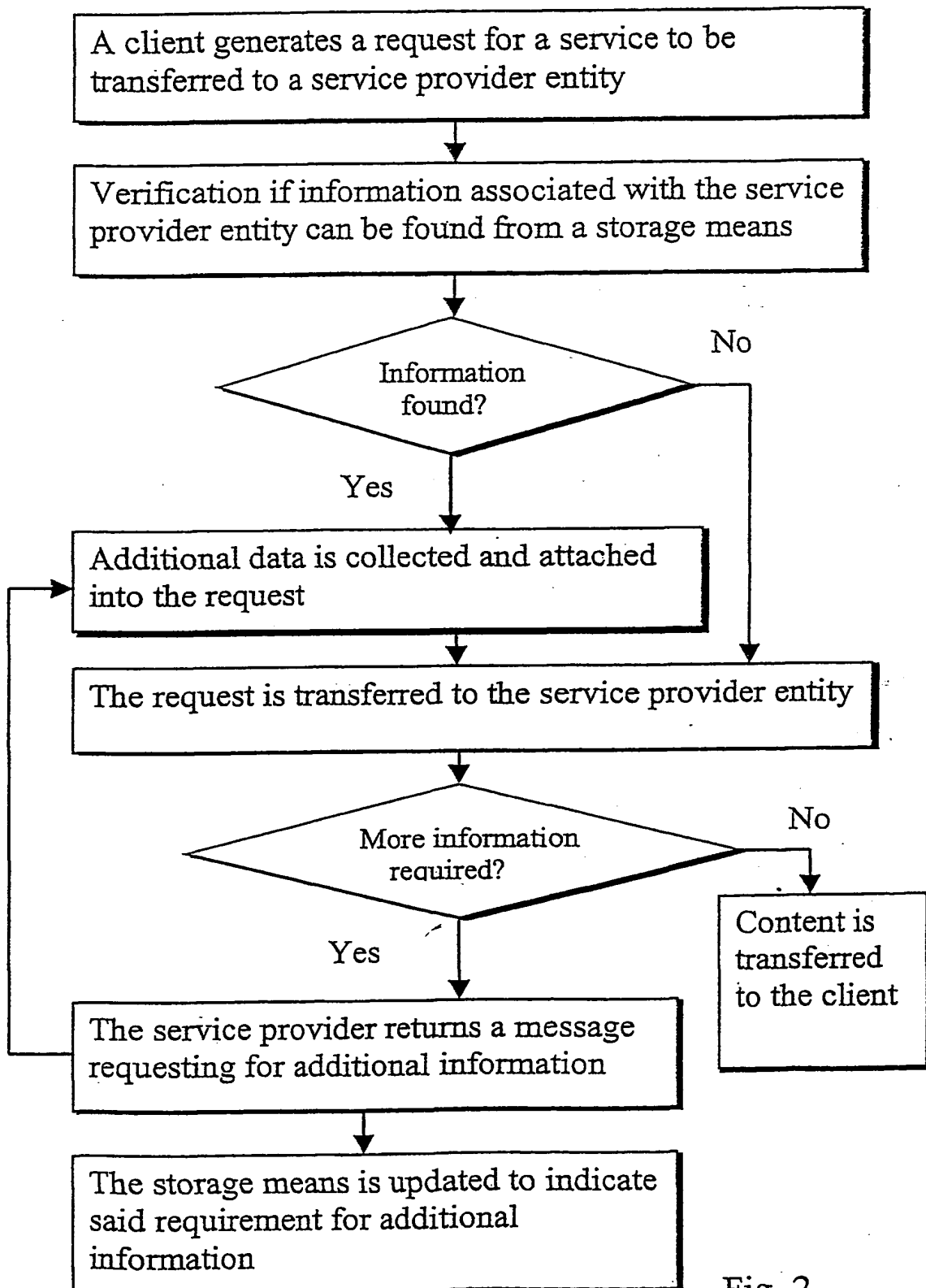


Fig. 2

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 November 2002 (28.11.2002)

PCT

(10) International Publication Number
WO 02/096063 A3

(51) International Patent Classification⁷: **H04L 29/06**

(21) International Application Number: **PCT/IB02/02863**

(22) International Filing Date: **24 May 2002 (24.05.2002)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
0112780.2 **25 May 2001 (25.05.2001)** **GB**

(71) Applicant (for all designated States except US): **NOKIA CORPORATION [FI/FI]; Keilalahdentie 4, FIN-02150 ESPOO (FI).**

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OVASKAINEN, Mika [FI/FI]; Strömbergintie 8 F 168, FIN-02150 Espoo (FI). MATTILA, Arto [FI/FI]; Vesilahdentie 94, FIN-37500 Lempäälä (FI). ZILLIKENS, Frank [DE/DE]; Buschstrasse 16, 45276 Essen (DE).**

(74) Agents: **STYLE, Kelda, Camilla, Karen et al.; Page White & Farrer, 54 Doughty Street, London WC1N 2LS (GB).**

(81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.**

(84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**

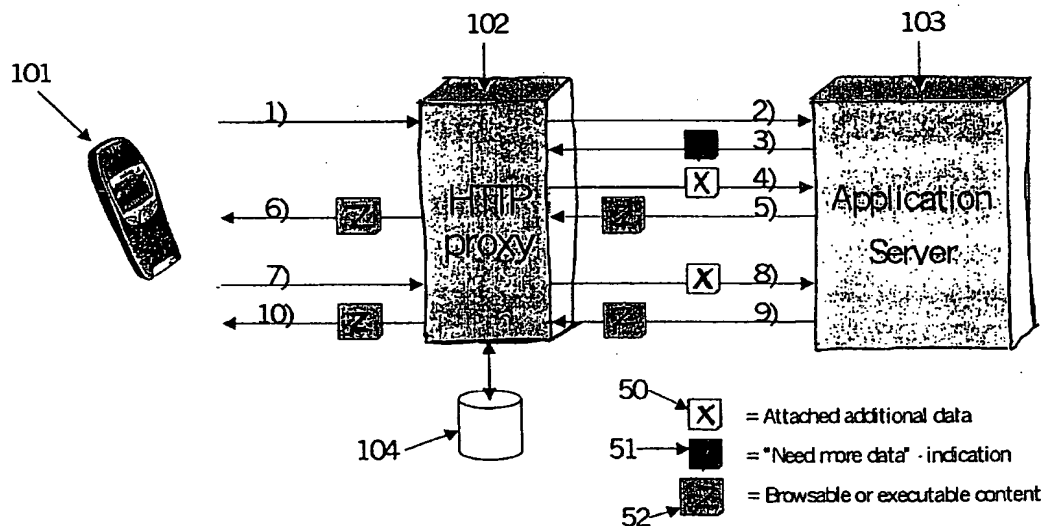
Published:

— with international search report

(88) Date of publication of the international search report:
5 June 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **REQUESTS IN A COMMUNICATION SYSTEM**



(57) Abstract: A method for provision of service in a communication system and a communication system is disclosed. When a request for a service is received it is verified if additional information needs to be attached to the request. The verification is based on information stored in the storage means. If it is detected that a service provider requires additional information in association with a request for a service, information associated with said detected requirement is stored in storage means to update said storage means.

WO 02/096063 A3

INTERNATIONAL SEARCH REPORT

ational Application No
PCT/IB 02/02863

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 799 594 A (CIT ALCATEL) 13 April 2001 (2001-04-13)	1-3, 6, 7, 9, 11-13, 16-28
A	abstract page 4, paragraph 2 -page 5, paragraph 6	4
X	EP 0 812 088 A (IBM) 10 December 1997 (1997-12-10)	1-3, 5, 6, 8-10, 12-15, 17-21, 28
A	page 8, paragraph 6 -page 9, paragraph 3 page 11, paragraph 2 - paragraph 3 page 12, paragraph 3 -page 13, paragraph 3 --- -/--	25, 27

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

30 January 2003

Date of mailing of the international search report

07/02/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3018

Authorized officer

Blanco Cardona, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 02/02863

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category:*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 30098 A (ERICSSON TELEFON AB L M) 26 April 2001 (2001-04-26) abstract page 3, paragraph 4 page 6, paragraph 4 -page 9, paragraph 2	1, 19, 28
A	WO 00 70838 A (PATIL UMESH R ;PIVIA INC (US); JORDAN DANIEL S (US); MOHAN SUDHIR) 23 November 2000 (2000-11-23) abstract page 5, paragraph 2 page 10, paragraph 5 -page 11, paragraph 6 page 15, paragraph 2 -page 18, paragraph 4	2, 3, 20
A	US 5 930 472 A (SMITH DWIGHT RANDALL) 27 July 1999 (1999-07-27) abstract column 5, line 19 - line 49 column 6, line 51 -column 7, line 9	7, 11, 16, 22-27

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 02/02863

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2799594	A	13-04-2001	FR 2799594 A1	13-04-2001
			EP 1102445 A1	23-05-2001
EP 0812088	A	10-12-1997	US 5961601 A	05-10-1999
			CA 2206685 A1	07-12-1997
			CN 1173671 A	18-02-1998
			EP 0812088 A2	10-12-1997
			JP 3290377 B2	10-06-2002
			JP 10097483 A	14-04-1998
WO 0130098	A	26-04-2001	AU 1182201 A	30-04-2001
			CN 1382352 T	27-11-2002
			EP 1222827 A1	17-07-2002
			WO 0130098 A1	26-04-2001
WO 0070838	A	23-11-2000	AU 4979400 A	05-12-2000
			WO 0070838 A2	23-11-2000
US 5930472	A	27-07-1999	AU 741463 B2	29-11-2001
			AU 3206099 A	16-11-1999
			BR 9909953 A	26-12-2000
			CA 2329480 A1	04-11-1999
			CN 1298517 T	06-06-2001
			EP 1086422 A1	28-03-2001
			JP 2002513183 T	08-05-2002
			WO 9956210 A1	04-11-1999

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 02/02863

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2799594	A	13-04-2001	FR 2799594 A1	13-04-2001
			EP 1102445 A1	23-05-2001
EP 0812088	A	10-12-1997	US 5961601 A	05-10-1999
			CA 2206685 A1	07-12-1997
			CN 1173671 A	18-02-1998
			EP 0812088 A2	10-12-1997
			JP 3290377 B2	10-06-2002
			JP 10097483 A	14-04-1998
WO 0130098	A	26-04-2001	AU 1182201 A	30-04-2001
			CN 1382352 T	27-11-2002
			EP 1222827 A1	17-07-2002
			WO 0130098 A1	26-04-2001
WO 0070838	A	23-11-2000	AU 4979400 A	05-12-2000
			WO 0070838 A2	23-11-2000
US 5930472	A	27-07-1999	AU 741463 B2	29-11-2001
			AU 3206099 A	16-11-1999
			BR 9909953 A	26-12-2000
			CA 2329480 A1	04-11-1999
			CN 1298517 T	06-06-2001
			EP 1086422 A1	28-03-2001
			JP 2002513183 T	08-05-2002
			WO 9956210 A1	04-11-1999

THIS PAGE BLANK (USPTO)

INTERNATIONAL SEARCH REPORT

 International Application No
 PCT/IB 02/02863

 A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 799 594 A (CIT ALCATEL) 13 April 2001 (2001-04-13)	1-3, 6, 7, 9, 11-13, 16-28
A	abstract page 4, paragraph 2 -page 5, paragraph 6	4
X	EP 0 812 088 A (IBM) 10 December 1997 (1997-12-10)	1-3, 5, 6, 8-10, 12-15, 17-21, 28
A	page 8, paragraph 6 -page 9, paragraph 3 page 11, paragraph 2 - paragraph 3 page 12, paragraph 3 -page 13, paragraph 3 — —/—	25, 27

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the International filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the International filing date but later than the priority date claimed

T later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the International search

30 January 2003

Date of mailing of the International search report

07/02/2003

Name and mailing address of the ISA

 European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax (+31-70) 340-3016

Authorized officer

Blanco Cardona, P

THIS PAGE BLANK (USPTO)

1/2

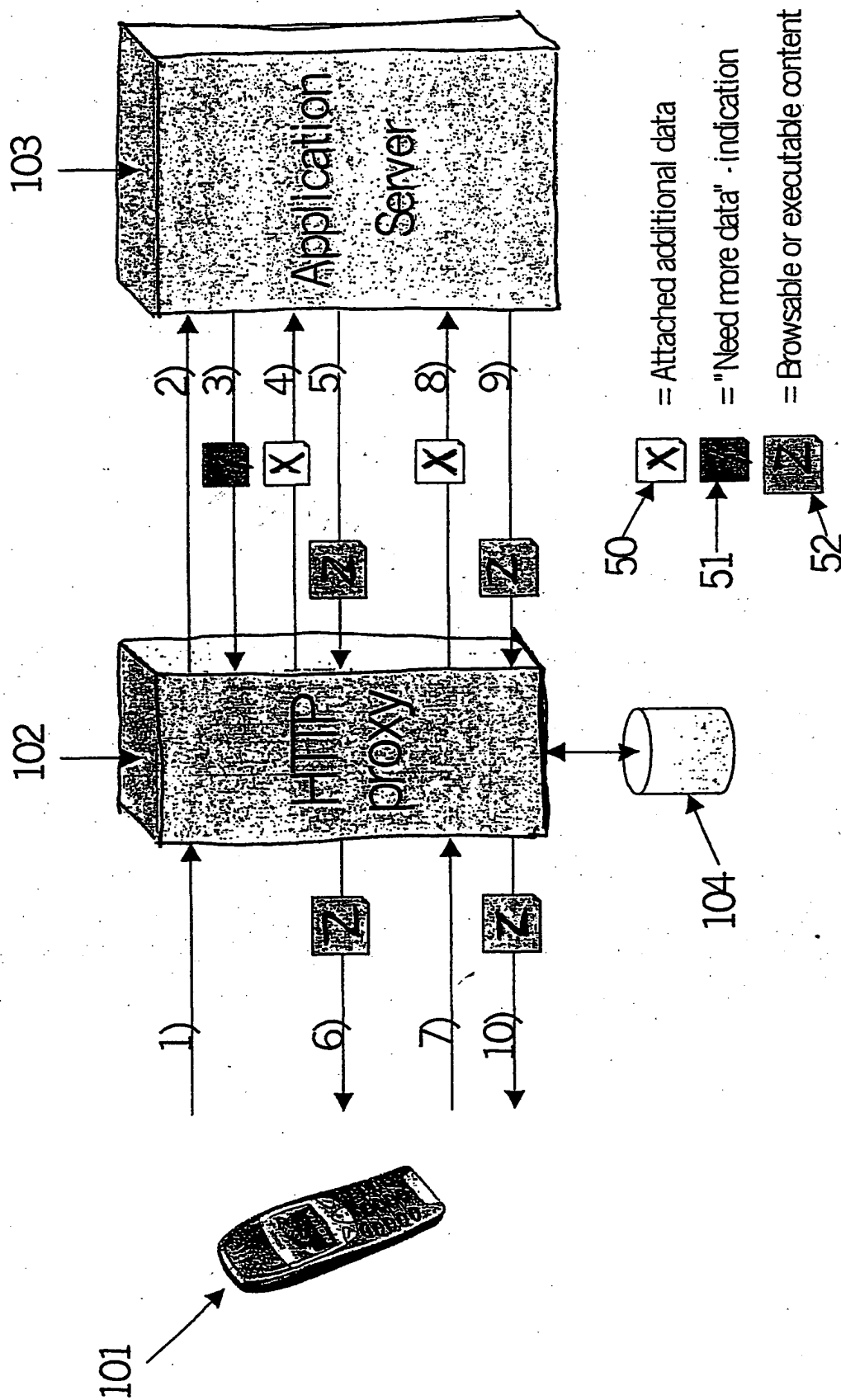


Fig. 1

THIS PAGE BLANK (USPTO)

21. A communication system as claimed in claim 19 or 20, comprising a client generating the request for the service.

22. A communication system as claimed in claim 21, wherein
5 the request from the client is received by an intermediate node comprising said storage means, said intermediate node being arranged to update the storage means and to attach the additional information to request send to the service provider.

10

23. A communication system as claimed in claim 22, wherein the intermediate node is adapted to collect said additional information based on information stored in the storage means.

15 24. A communication system as claimed in claim 22 or 23, wherein the intermediate node comprises a proxy server.

25. A communication system as claimed in any of claims 22 to 24, wherein intermediate node is adapted to operate in
20 accordance with the hypertext transfer protocol (http).

26. A communication system as claimed in claim 22 or 23, wherein the intermediate node comprises a gateway.

25 27. A communication system as claimed in claim 26, wherein the gateway is adapted to operate in accordance with the wireless application protocol (WAP).

28. A server of a communication system, comprising:
30 means for determining if additional information in association with requests for services is required by service providers;

THIS PAGE BLANK (USPTO)

said storage means, said intermediate node accomplishes said verification, and subsequent to the verification transfers the request with or without the additional information to the service provider.

5

8. A method as claimed in claim 6, wherein the client accomplishes said verification prior transmission of the request.

10

9. A method as claimed in any preceding claim, wherein said additional information is collected based on information stored in the storage means.

15

10. A method as claimed in claims 8 and 9, wherein the client collects said additional data.

11. A method as claimed in claims 7 and 9, wherein the intermediate node collects said additional data.

20

12. A method as claimed in any preceding claim, wherein said request includes address information associated with the service provider.

25

13. A method as claimed in claim 12, wherein said address information comprises a universal resource locator (ULR) of the service provider.

30

14. A method as claimed in any preceding claim, wherein the step of storing information associated with said detected requirement comprises storing information about the address of the service provider.

THIS PAGE BLANK (USPTO)

associated with a request is found from the database, this indicates that the request is an the exceptions to the default rule.

- 5 It is also possible to store information associated with groups of service providers so that a service provider of the group will be provided or alternatively will not be provided with the additional information.
- 10 It should be appreciated that whilst embodiments of the present invention have been described in relation to mobile stations, embodiments of the present invention are applicable to any other suitable type of user equipment.
- 15 It is also noted herein that while the above describes exemplifying embodiments of the invention, there are several variations and modifications which may be made to the disclosed solution without departing from the scope of the present invention as defined in the appended claims.

THIS PAGE BLANK (USPTO)

6) as a response to the original request 1) by the client entity 101.

When the client entity 101 sends a new request 7) associated with the same URL again the intermediate server 102 can now find said URL from the persistent storage means 104 because the URL was stored in response to the step 3) above. Based on this the intermediate server 102 knows that this URL needs additional data to be attached to the request.

10

Step 3) also provided the intermediate node with description of the data that needs to be provided for the service provision entity 103. The intermediate node 102 may thus then collect and/or generate the additional data 50) and attach the additional data to the request 8) to be sent to the service application 103.

The service application entity 103 then generates the content based on the additional data and returns the content in a response 9). The intermediate node 102 then delivers the response 10) to the client 101.

To summarise the learning procedure, a service application entity may require additional information from an intermediate node to be attached to a request for a service. Upon realising this, the intermediate node may store the URL or other identity information that associated with the service application entity in a storage means. During further interactions with clients, the intermediate node may then immediately check from the storage means whether the request needs to be augmented with additional information prior to its transmission to the service application entity.

THIS PAGE BLANK (USPTO)

be found from the list this means that the service pointed by that URL needs additional data to be attached to the request.

The following will describe a possible operation with
5 reference also to the flowchart of Figure 2.

The client entity 101 may initiate service provisioning by sending a request 1) for content to the service provisioning server 103. The source of the service is indicated by the
10 means of a uniform resource locator (URL) of the service provisioning server 103.

The intermediate server 102 receives the request 1). The intermediate server 102 then verifies if the URL can be found
15 from the persistent storage means 104. If the URL is found then the intermediate server 102 fetches and/or generates the additional data that the service application 103 needs.

A description of the additional data may also be stored in
20 the storage means 104. The intermediate node then collects the data from appropriate sources and attaches the data in the request. For example, if the additional data comprises location information the intermediate node may request location information e.g. from a location service node, from
25 the mobile station client itself and so on.

After having attached all required data to the request the intermediate server 102 sends the request to the service application 103 with the additional data.

30

If the intermediate server 102 does not find the URL from the list in the persistent storage means 104, the request can be

THIS PAGE BLANK (USPTO)

The client entity 101 may be any entity that is adapted to request for a service from the service application server entity 103 and to make use of content provided by the service application entity 103 in response to said request. The
5 content may be used, for example, for execution of a program employed in provision of a service requested by the client entity 101.

In Figure 1 the client entity 101 is shown to comprise a
10 mobile station (MS). The mobile station may comprise a mobile telephone or other portable device that may be used for voice and/or data communication by the user thereof. The mobile station 101 may communicate via a wireless interface with a transceiver entity of a cellular communication network in a
15 manner known by the skilled person.

In a more specific embodiment the client entity comprises e.g. a browser function of the mobile station or a computer. The client may also be a program that makes use of content
20 provided by the service application entity 103.

The intermediate node 102 is located on the message path between the client 101 and the service application server entity 103. The intermediate node 102 is adapted to act as a
25 client to the service provider entity 103. The mobile station 101, in turn, is the client for the intermediate node 102.

The intermediate node 102 may, for example, comprise a proxy server. The intermediate proxy server may be arranged to
30 operate in accordance with an appropriate transfer protocol such as the hypertext transfer protocol (HTTP) or similar. The intermediate node may also comprise a wireless application protocol (WAP) gateway. Any other entity

THIS PAGE BLANK (USPTO)

services; and means for verifying if additional information needs to be attached to the requests for services based on information stored in the storage means.

- 5 In a form of the invention said storing of information is triggered by a request by the service provider for additional information. The service provider may send said request for additional information in response to receiving a request for service that is insufficient from the information content
10 thereof. A failed request may also trigger said step for storing information. An operator may also trigger said step for storing information.

- The received request may originate from a client. The request
15 from the client may be received at an intermediate node comprising said storage means. Said intermediate node may be adapted to accomplish said verification and subsequent thereto to transfers the request with or without the additional information to the service provider. Said
20 verification may also be accomplished by client.

Said additional information may be collected based on information stored in the storage means.

- 25 Said request may include address information associated with the service provider. Said address information may comprise a universal resource locator (ULR) of the service provider.

- The step of storing information associated with said detected
30 requirement may comprise storing information about the address of the service provider. The step of verifying may comprise checking if information associated with the address of the service provider can be found from the storage means.

THIS PAGE BLANK (USPTO)

The service application entity may be identified by the means of a uniform resource locator (URL) or similar address indicator. The intermediate server entity receives the request and forwards the request to the service application
5 entity.

The service application entity may need additional data associated with the client in order to be able to provide the requested content. However, the service application entity
10 may notice after reception of the request that the request does not contain all data that is required for provisioning of the requested content. The service application entity may thus need to request more information from the intermediate server entity. In the prior art this is accomplished by means
15 of a message that indicates that additional data is needed. Said message may also contain information what kind of additional data the service application entity needs.

The intermediate server entity receives the message and in
20 response thereto collects the requested additional data and sends either the additional data or a new request incorporating the requested additional data. The new request may be a repeat of the original request such that it includes also said additional data.

25 The service application entity may thus need to receive the new request before being capable of generating and returning any content in response to the request. The additional signalling between the service application provisioning
30 entity and the intermediate node consumes communication resources. This kind of operation is also time consuming. The queries also cause additional workload for the service

THIS PAGE BLANK (USPTO)